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High energy kink in the single particle spectra of the two-dimensional Hubbard model¹ ALEXANDRU MACRIDIN, MARK JARRELL, University of Cincinnati, THOMAS MAIER, Oak Ridge National Laboratory, DOUGLAS SCALAPINO, University of California, Santa Barbara — Employing dynamical cluster quantum Monte Carlo calculations we show that the single particle spectral weight $A(k, \omega)$ of the one-band two-dimensional Hubbard model displays a high energy kink in the quasiparticle dispersion followed by a steep dispersion of a broad peak similar to recent ARPES results reported for the cuprates. Based on the agreement between the Monte Carlo results and a simple calculation which couples the quasiparticle to spin fluctuations, we conclude that the kink and the broad spectral feature in the Hubbard model spectra is due to scattering with damped high energy spin fluctuations.

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